

Processing and Products

511P Withdrawn.

512P Effect of freezing on black bone syndrome in broiler chickens. Cristiane Sanfelice^{*1}, Sacit F. Bilgili², Joseph B. Hess², and Ariel A. Mendes¹, ¹*Department of Animal Production, São Paulo State University, Botucatu, São Paulo, Brazil*, ²*Department of Poultry Science, Auburn University, Auburn, AL*.

Black bone syndrome (BBS) is a quality defect occasionally observed on bone-in leg quarters following cooking. The aim of this study was to determine the incidence and severity of BBS following refrigerated and frozen storage in broiler chickens. A total of 1,120 male Ross × Ross 708 broilers were reared in floor pens (14 per treatment). At 35 d of age, 10 birds per pen (280 total) were processed and carcasses chilled in slush-ice overnight. The following day, leg quarters (thigh and drumstick) from each bird were placed in a freezer bag and immediately frozen (−4°C) or placed in a plastic bag and kept refrigerated (4°C) for 5 d. Both refrigerated and frozen-thawed (24 h at 4°C) leg quarters were then cooked covered in a convection oven to an internal temperature of 71°C. Cooked leg quarters were allowed to cool, adhering meat removed and then scored for BBS severity both visually (3-point scale: where 0 = normal, 1 = mild, and 2 = severe) and objectively by a Minolta colorimeter (L^* , a^* and b^*). The data were subjected to Analysis of Variance and means were separated by Tukeys Test when significant ($P < 0.05$). The visual BBS scores as well as objective color values were significantly affected by the storage method. Severe BBS incidence was 55.5 and 6.5% for frozen and fresh stored leg quarters, respectively. Objective color measurements also differed significantly between the frozen vs. fresh stored thigh bones ($L^* = 32.2$ vs. 46.8; $a^* = 11.14$ vs. 8.17; and $b^* = 7.35$ vs. 9.84). The freezing resulted in higher incidence and severity of BBS. Because leg quarters are commonly marketed frozen, the rate of freezing (slow vs. fast) should also be investigated as a potential contributor factor to BBS.

Key Words: black bone, leg quarter, color

513P Effect of the sampling procedure on the determination of volatile fatty acid concentrations in the cecum of broilers fed diets based on corn or wheat. L. Cámara^{1,2}, M. V. Kimiaetalab¹, M. D. Carro^{1,2}, and G. G. Mateos^{*1,2}, ¹*Departamento de Producción Agraria, Universidad Politécnica de Madrid, Madrid, Spain*, ²*CEI Campus Moncloa, UCM-UPM, Madrid, Spain*.

The methodology applied for processing digesta samples before laboratory analysis may affect the analytical results. The aim of this study was to assess the influence of sample processing on the concentration of the volatile fatty acids (VFA) in the cecum of 25-d broilers fed corn- or wheat-based diets. The experimental design was a split-plot, with diet as the main plot and sample processing as the subplot. Each treatment was replicated 8 times (4 broilers each). Cecal samples were obtained by pooling the contents of 2 broilers chosen at random from each replicate. After homogenization, samples were split into 3 aliquots which were allotted to one of the 3 following treatments: CON) immediately frozen and processed without any acidification; FAC) frozen and acidified (1 mL 0.5 N HCl/g) in the laboratory before VFA analyses; and ACF) immediately acidified and frozen. As compared with the ACF, total VFA and acetate concentration decreased by 9.4 and 11.2% with the use of the FAC procedure and by 9.4 and 13.0% with the use of the CON procedure, respectively ($P < 0.05$). Propionate, butyrate, and isovalerate concentrations were lower ($P < 0.05$) in the FAC samples

than in the ACF and CON samples. Valerate concentration was highest ($P < 0.001$) in the samples analyzed without any acidification. Main cereal of the diet did not affect total VFA and acetate concentration but corn-fed broilers had higher ($P = 0.05$) concentrations of propionate, isobutyrate, valerate, and isovalerate, and lower ($P < 0.05$) of butyrate than wheat-fed broilers. In summary, when the cecal samples were not acidified before being frozen and stored, total VFA and acetate concentrations decreased but the differences detected between diets were similar for all the tested methods. The acidification of the cecal contents at the time of sampling is recommended for improving the accuracy of VFA values.

Key Words: broiler, cereal, cecum, volatile fatty acids, processing method

514P First results on chemical, technological, histological and genomic analysis of white striping and wooden breast myopathies affecting broiler pectoralis major muscle. Massimiliano Petracci^{*1}, Paolo Zambonelli¹, Francesca Soglia¹, Martina Zappaterra¹, Maurizio Mazzoni², Federico Sirri¹, Claudio Cavani¹, and Roberta Davoli¹, ¹*Dept. of Agricultural and Food Sciences, University of Bologna, Bologna, Italy*, ²*Dept. of Veterinary Medical Sciences, University of Bologna, Ozzano dell'Emilia (BO), Italy*.

Only a few years ago, the poultry industry began to face an abnormality in breast meat known as wooden breast, which frequently coincides with white striping. The aim of this study was to assess genomic profile of abnormal breast muscles and evaluate its effect on the histology, composition, and technological traits of the meat as well as on gene differential expression. For this purpose, 10 normal (NORM) and 10 wooden and white-striped (WB/WS) p. major muscles were obtained from the same flock of heavy broilers (males of 3.8 kg live weight) from a commercial plant and used to assess composition (moisture, protein, fat, ash, collagen, sodium and calcium) and technological traits of both raw (pH, color, drip loss, cooking losses and shear force) and marinated (marinade uptake, cooking losses and shear force) meat. Furthermore, a transcription profile of the RNA extracted from the 20 samples was obtained by hybridizing Affymetrix expression arrays. If compared with NORM group, WB/WS fillets exhibited significantly higher fat, moisture and collagen contents coupled with a dramatic lower amount of protein (18.5 vs. 23.4%; $P < 0.01$). In addition, there was a decrease in water holding/binding capacity as demonstrated by lower marinade uptake and higher cooking loss in both raw and processed meat. WB/WS fillets also had higher levels of calcium (11.3 vs. 7.8 mg/100 g; $P < 0.05$) and sodium (75.1 vs. 37.8 mg/100 g; $P < 0.01$) and more histological lesions characterized by fiber degeneration, fibrosis, and lipidosis. The functional categories of the differentially expressed genes supports these results because the main metabolic processes differentiating NORM and WS/WB groups are related to cellular development, extra cellular matrix metabolism, calcium and sodium metabolism supporting a muscle degeneration similar to a myopathy. In conclusion, this study seems to indicate a causative genetic origin of emerging breast muscle abnormalities and it is confirmed their dramatic effect on nutritional and technological properties of the meat.

Key Words: chicken breast abnormalities, white striping, wooden breast, genomic, meat quality

515P Withdrawn.